

ABSTRACT

An autonomous down hole survey tool and method for determining deviation angles of a well bore while tripping. The instrument package assembly is carried in a commercially available running gear and utilizes a low voltage solid state electronic apparatus in cooperation with a method for detecting and correlating desired measurements such as pitch, roll, azimuth and temperature taken from a bored hole in an autonomous manner and electronically recovering such data from the instrument upon its return to the surface. The apparatus includes electronic measurement sensing circuitry that includes a compass/magnetometer utilizing a tilt compensated linear/compass, dual axis tilt system, housed in a high tensile strength non-metallic casing sleeve with a self centering capability. The system further includes electronic communications programming and retrieval cabling and a portable computer processor unit. The method of operation includes the steps of providing the autonomous instrument with an onboard computer/program set for acquiring a plurality of desired duplicate measurements taken from the borehole at pretimed intervals, storing a plurality of such measurements taken along the borehole path with their associated time marks stored in memory, and providing a method for manually inserting depths into a surface computer coordinated with the down hole timed intervals.